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Problem Oriented Project Based Learning (POPBL) in Promoting Education for Sustainable Development

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Abstract

Higher Education is not excluded in realizing the effort of promoting Education for Sustainable Development (ESD). Hence a framework of learning should be introduced to the students which at least include elements such as lifelong learning, interdisciplinary approaches, systems thinking, partnerships, multicultural perspectives and empowerment. To have all of these elements in a course is quite challenging. This paper will discuss the framework of teaching and learning a course using Problem Oriented Project Based Learning (POPBL) in an effort to promote ESD. POPBL is developed as an intervention in an action research cycle.

Keywords: Education for Sustainable Development; Problem Oriented Project Based Learning; Lifelong Learning.rth keywords;

1. Introduction

Education is undoubtedly accepted as a major means in changing and transforming human behaviour and practices towards a healthy and sustainable life. In the world of globalization and the new economic of today, challenging life with highly compatitive environment requires student to seek knowledge beyond the classroom and textbook as well as to have quality communication, problem solving and leadership skills. As an agent of change, education should be designed to incorporate the basic domain of knowledge, skills as well as values across disciplines.

The Education for Sustainable Development (ESD) is an essential part of a larger conversation regarding quality of life for all the inhabitants of Earth (UNESCO, 2005) in which economic, social, and environmental factors must be considered in relation to one another. Therefore it is about how education should be planned to serve the real life situation without compromising the societal and environmental values of future generation (WCED, 1987).

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In responding to these issues, a comprehensive curriculum with a right or suitable pedagogy and support must be introduced to the students especially in teacher training programme since teacher is a catalyst to development of values and behaviour. The questions are: what is the curriculum content that should be introduced? And what is the appropriate approach to teaching and learning? Problem Oriented Project Based Learning (POPBL) is seen as a potential approach in promoting SD with the assumptions that graduates will learn better when what they learn is meaningful, relates to their real life situation and be its allow them to experience it.

2. Framework of Higher Education for Sustainable Development

Chapter 36, Agenda 21 (Bruntland Report 1987) has suggested six dimensions that should be integrated: lifelong learning, interdisciplinary, thinking system, partnership, multicultural and empowerment to be the main domain of higher education curriculum and practices. After 18 years of the inception of the sustainable development concept, UNESCO has come out with the Guidelines and Recommendation for Reorienting Teacher Education to Address Sustainability and has declared year 2005-2014 as United Nation Decade of Education for Sustainable Development.

2.1. Lifelong Learning

Education is seen as a continuous process in individual life. It can be in the form of formal, informal and non-formal. Therefore it should not have limit to enquire learning about and for sustainability. The main skill of lifelong learning is learning how to learn.

2.2. Interdisciplinary Approach

Sustainable education requires individual to understand about interdependence and interconnections between human being and its environment. Hence, courses at the university or colleges need to integrate environmental, social and economic issues in its course work in order to develop interest towards science and other disciplines. The incorporation of these three elements of sustainable development can enhance the process of learning to be more relevant with the real life of the individual and the community. This effort should be undertaken in both the content and its pedagogy.

2.3. Thinking System

The Learning process that takes place should include the critical, creative and innovative thinking, conflict resolution, problem solving, information management and interpersonal expression. The thinking should be a rational thinking coupled with emotional stability.

2.4. Partnership

Education alone will not move citizens and governments to create a more sustainable future. Many people and organizations must share the responsibility for more sustainable societies through good government, enlightened policy, civic participation and commitment (UNESCO 2005:2). Public awareness on sustainability and sustainable development can be achieved through addressing local sustainable issues which has close proximity to the learners and the community as a smart partner. These partners could be from business and industry, workplace, religious center, NGOs, government department and others in the community.

2.5. Multicultural Perspective

Since the concept of sustainability is more diverse and not only limited to environmental issues but also social-cultural issues such as poverty, inequality and peace, the method used in handling all of these issues should be approach through multicultural perspective. Understanding and respect of others' values and culture is a paramount important towards unity.

2.6. Empowerment

Students' engagement and learning will be more meaningful when they are given the opportunity to determine the issues of their interest, conduct research and suggest the solution to the problem in study. Through this exercise it is believe that it could mould and gain student confident to be a responsible citizen and contribute to the sustainable development.

3. POPBL for Sustainable Development

The introduction of a multidisciplinary course within which almost all generic competencies required for employability and sustainability can only be delivered through a complex curriculum and innovative teaching and learning as oppose to traditional teaching method. This is because at lease all six dimensions able to be integrated through its content and activities. Project based learning is a very common practice in higher education around the globe. However there is a crucial difference between project based in subject-oriented curriculum and problem-oriented project work (Olsen & Pedersen, 2005). In this paper it is refer to the project work in the problem oriented curriculum. In a normal subject-based curriculum students usually are given or chosen the topic to be dealt further. In contrast, POPBL has to start with the analysis of a research problem followed by the design of the project to solve the problem through the implementation of the activity planned in order to solve the problem under study. The learning outcome is not merely general knowledge and forming an overview, but the development of analytical skills and an ability to argue and present solutions and answer to challenging questions.

Problem Based Learning is a well known approach in medical education and it has been a practice for over 40 years in a various disciplines (Strobel & Barneveld, 2009). However the approach might be different according to the model, discipline and context. In medical PBL approach, problem is introduced before hand and students will brainstorm for possible solution and justification based on content knowledge. In contrast, problem is formulated by the student in POPBL.

The basic principles of POPBL can be summarized as:

- Student-centered and able to motivate and gain commitment among students
- Problem-oriented and not subject-oriented
- Focus is more on learning process in finding solution rather than recall knowledge
- Project-Based which has goal and action for change
- Exemplarity instead of generality
- Promote group work/team work, social and communication skills

There are four main phases in POPBL approach namely

- Group Formation
- Problem formulation
- Design and data collection (project implementation) and
- Data analysis and report writing.

4. POPBL in Life Sciences in Education Course

Life Sciences in Education course is the first course of ESD introduced in teacher education programme in Malaysia specifically at the National University of Malaysia. The course is first introduced in 2005 as the

recommendation of UNESCO. It is a compulsory course in the final year and can consider as a finishing school course.

4.1. Curriculum (Input)

The course aims to promote sustainable education through quality life styles. The five main focuses are environment, community and family, mental health, physical and emotional as well as interaction and interpersonal communication. This interdisciplinary focus intertwined with other elements of sustainable education mentioned earlier through the content and activities which students require to perform in their project. The course is divided into a few lectures to the whole group is given at the very beginning of the semester (figure 1), group supervision which started after group formation in the 3rd week until the end of the semester before the final presentation. The course is run by several lecturers as the main resource person in giving the lecture while other facilitators are also helping with the small groups because the class size is very big (130-350). The lecture is about 2 hour for 7 weeks and the remaining time is allocated for supervision and self directed learning.

4.2. Assessment and Monitoring (Process)

The assessment is done thru out the course (formative evaluation). Since the nature of the course is to give students understanding about the concepts and students should be able to sustain it through the experiential learning, there is no standardize test given. Assessments are in the form of open ended quizzes (written and oral) conducted in both big and small groups. Another important measure used is a weekly reflective journal which employed meta-cognitive approach. In the reflective journal students are sharing their process of learning. In another words they are also doing self evaluation on their own learning process. Portfolio assessment is used to measure students' effort, creativity & innovation, analytical skills, leadership and team work. The communication skill is gauge through oral presentation and written report and reflective journal. Every lecturer is given a copy of the assessment rubric.

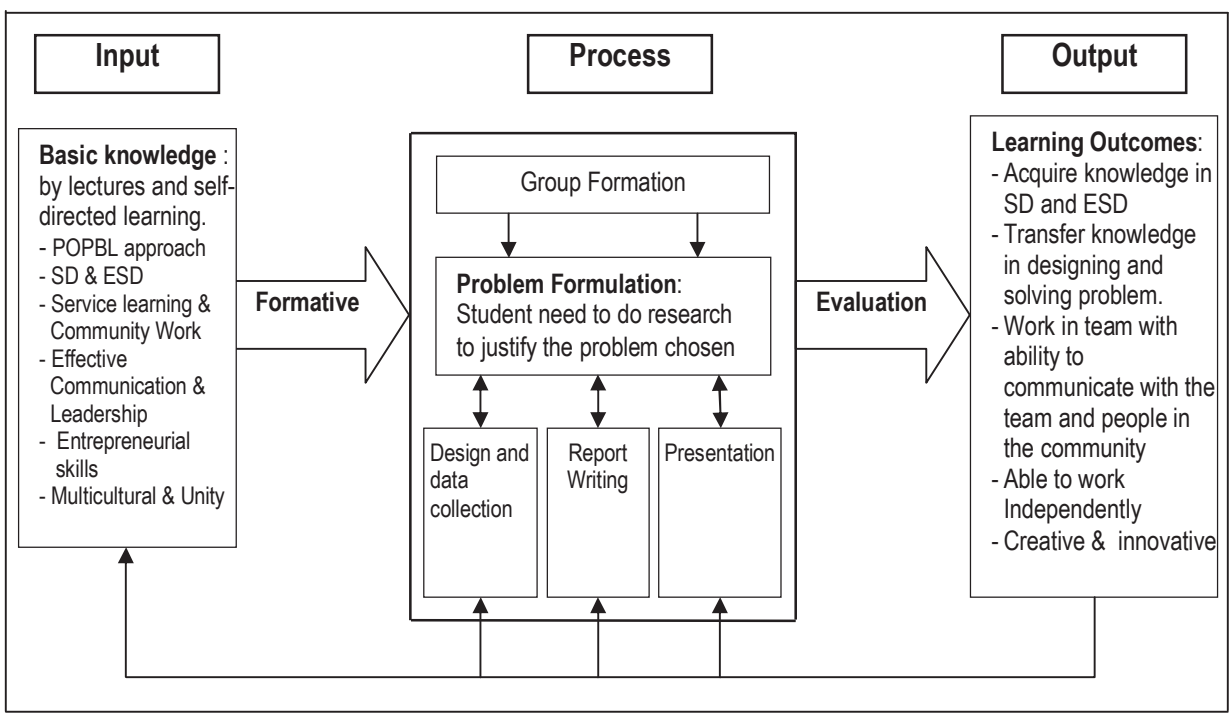

Figure 1. Input, Process and Output of Life Sciences in Education

5. Reflection on the Implementation of POPBL

The decision to use POPBL approach is made based on the 3 years experience in conducting the course using traditional lecture and project based. Through that experience students were able to plan and manage the project but they are still lack of research and argumentative ability when looking for a problem and discussing the issues. By employing POPBL approach at least it has some structure at all phases. Most students are so used to the traditional method whereby everything is given by the lecturers. Therefore it is not surprise when they said they feel kind of lost at the very beginning of the class despite of the introduction and explanation given at the very beginning of the class. They also failed to see the connectedness between the contents lectured because very few of the students discuss about these in their reflective journal. Some of the students were compliant that the tasks given were over whelming. However, I see this as their ability to manage their time well because all work has to be done in group. Another challenge for them is they have to raise their own fund in order to have the project done. The faculty only give some seed money which is not enough.

The positive aspect about students voices are they enjoy and learn so much through the community involvement. Here they learn and apply the generic skills such as team and interpersonal communication. They also observed and experiencing the learning in the real life situation (field) for example those who had programme with the aboriginal people. What they need is more guidance as they are undergraduate students with full hands of assignments. This is in line with what discussed by Strobel & Baneveld (2009).

6. Conclusion

Higher education plays a very important role in educating citizen for sustainable development in all aspects of life. With the right knowledge, skills and attitude of well- trained teachers, the lowest level of public awareness could be improved. The content introduced in the teacher training programme as well as the didactical approach should be match with learning outcomes of the course. The Education for sustainable Development is the world agenda which should be introduced at the very beginning of the educational level and can also be considered as part of lifelong learning agenda. The nature of the approach taken in teaching and learning for ESD could be an approach that can motivate the students for self directed learning and learning how to learn. Problem Oriented Project Based Learning is considered as an appropriate approach since it has a very structured approach that integrate a research elements, generic skills to interdisciplinary curriculum drawn from a real life situation. It allows students to experience the real life situation which is believed to have a more retention effect. The challenges in implementing the POPBL approach are more in the management aspect and the monitoring of students progress. Despite of various draw back in the management and monitoring students felt that the course was very useful and meaningful to them.Assessment and monitoring in PBL and POPBL is always become an issues (Sulaiman Yamin,2010 & Ravitz, 2009). For future action, the attention should be given to the effort of producing a model of assessment for the context of our students and our environment.

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